

# Acquiring Data During Routine Operations

Robert Swanson, FedEx Express



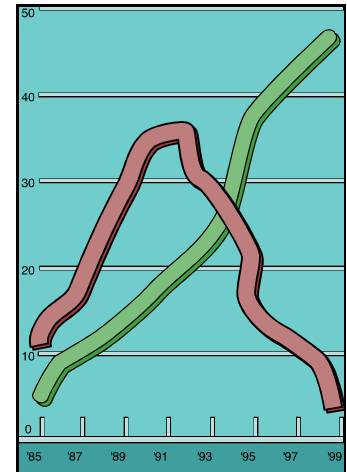
# From The Plane To The Screen

## Goal

Sense and record status of aircraft systems



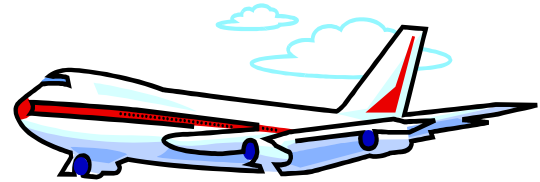
Accurately display actual conditions during ground conversion



# Sensing On-board Systems

Newer aircraft

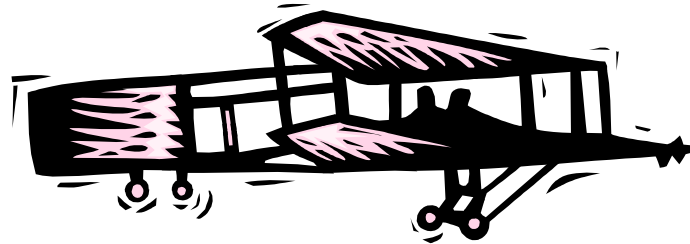
Digital data busses



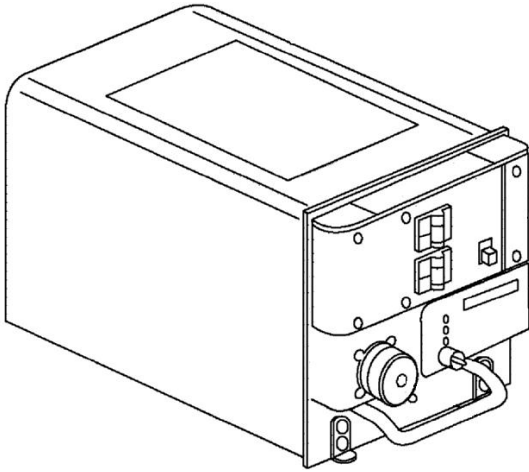
Older aircraft

Existing sensors

Additional sensors



# Acquisition and Recording

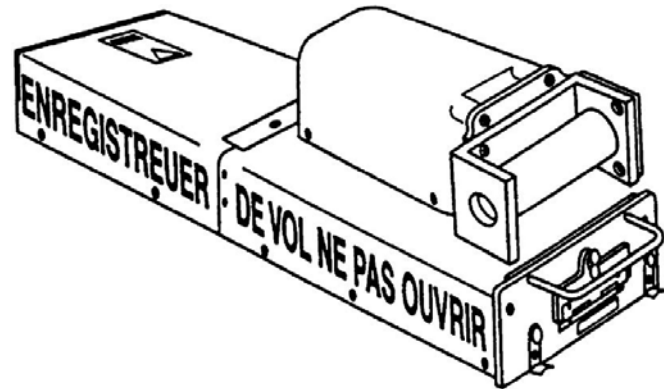


## Flight data acquisition

- Input limitations
- Dataframe changes
- Volume of available data

## Recording medium

- Crash-survivable recorder
- PCMCIA memory card
- On-board server
- Quick access recorder (QAR) tape/optical disk
- Memory size considerations



# Downloading from Aircraft

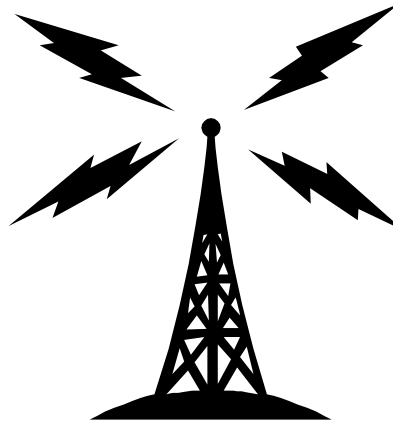
## Manual retrieval

- Removal of recorder
- Removal of recording medium (tape, disk, card)



## Automatic download

- Gatelink (802.11)
- Cellular



# Conversion of Digital Recording into Real-life Engineering Units

How do you convert bits  
to meaningful data?

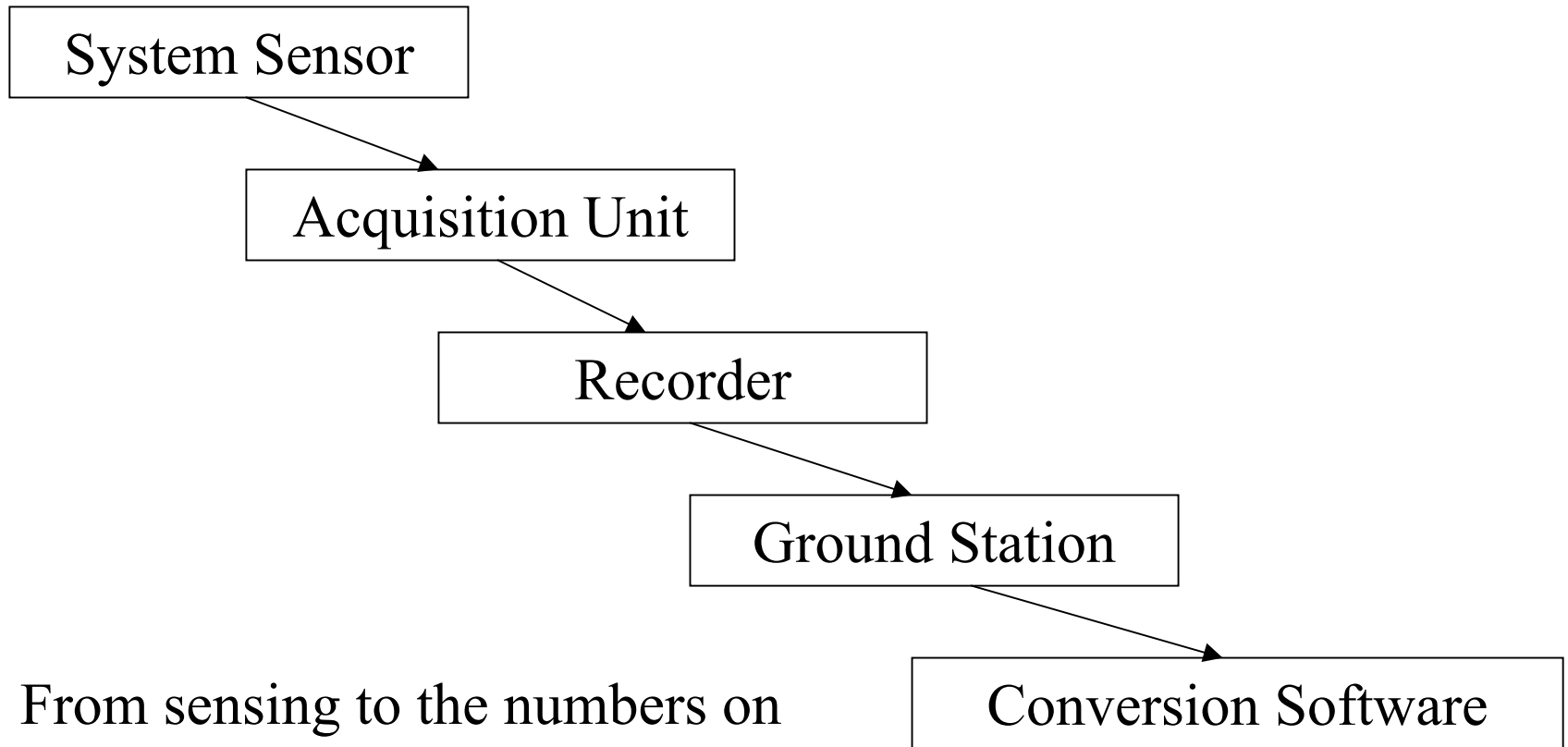


# Conversion of Digital Recording into Real-life Engineering Units

- Databus parameters  
Conversion info provided by manufacturer of source unit
- Discrete parameters  
On/off, up/down, left/right
- Analog parameters  
Synchros, potentiometers, etc.  
On-aircraft tests, data tables, graphs, equations



# Summary



From sensing to the numbers on the paper, the reading should be the same.



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Sense and record status of aircraft systems



Accurately display actual conditions on the ground

